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EXAMINER

SANDERS, AARON J

ART UNIT

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2168

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/826,160	Applicant(s) ZENG ET AL.	
	Examiner AARON SANDERS	Art Unit 2168	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-15,17-31,33-45,47-50 and 52-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-15,17-31,33-45,47-50 and 52-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/28/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

The amendment filed 28 October 2008 has been entered. Claims 1, 3-15, 17-31, 33-45, 47-50, and 52-54 are pending. Claims 1, 4, 9, 13-15, 17-24, 27-31, 34, 36-39, 43-45, 48, and 50 are currently amended. Claims 2, 6-8, 10, 16, 32, 40, 46, and 51 are cancelled. No claims are new. This action is FINAL, as necessitated by amendment.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the method of claims 1 and 15 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will

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be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The last sentence of par. 27 references pars. 22-24 as describing hierarchical one-problem-to-multiple-cause-multiple-solutions, but the referenced paragraphs come before par. 27 and do not discuss hierarchical one-problem-to-multiple-cause-multiple-solutions. Appropriate correction is required.

Claim Objections

Claims 1, 3-4, 9, 15, 17, 19, 21, 23-24, 29, 31, 33, 35-37, 39, 45, 47, and 50 are objected to.

As per claim 1, the phrase “based a link feature to a same product support article” is incorrect.

As per claims 3-4, 17, 33, and 47, the “and” in the phrase “and wherein” is incorrect.

As per claim 4, “the historic and hierarchically structured problem diagnosis data” and “the symptom” lack antecedent basis in the claims. Further, “term(s)” is improper because it is not clear if Applicant means “term” or “terms.”

As per claim 9, “the information” and “the unstructured service requests log” lack antecedent basis in the claims.

As per claims 9, 39, and 50, it appears that the phrase “engineer communications and the information” should be “engineer communications, and wherein the information.”

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As per claim 15, the phrase “by a computing device, unstructured service requests” should be “by a computing device, an unstructured service requests.” The phrase “product support engineer communications” should be “product support engineer’s communications.” Further, it appears that the phrase “resolution information and each structured answer object” in the “converting” step should be “resolution information, and wherein each structured answer object.”

As per claims 19-21, the “computer-executable instruction” should be plural.

As per claim 21, the phrase “wherein providing the set, the set comprises” is incorrect.

As per claims 23 and 50, “the user” lacks antecedent basis in the claims. There is an “end-user,” however.

Claim 24 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of claim 23. Applicant is required to cancel the claim, or amend the claim to place it in proper dependent form, or rewrite the claim in independent form.

As per claim 29, the phrase “wherein data fields” should be “wherein the data fields.”

As per claim 31, the phrase “unstructured service requests log of end-user and a product support engineer communications” is incorrect. It appears that it should be “unstructured service requests log of an end-user and a product support engineer’s communications.”

As per claims 33 and 36, “comprise” should be “comprises.”

As per claims 35-37, “the computer-executable instruction” lacks antecedent basis in the claims.

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As per claim 45, the phrase “converting unstructured service requests log” should be “converting an unstructured service requests log.” Further, there should not be an “and” after the “means for identifying” limitation.

Claim Rejections - 35 USC § 112, First Paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 9, 14, 22-23, 28, 38-39, 44-45, and 50 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

As per claim 1, the limitation “wherein one structured answer object is formed from one unstructured service requests log” does not appear in the specification. Rather, according to par. 27, “A single SAO 110 is generated from a single service request,” not the service requests log. Further, the limitation “based a link feature to a same product support article, the link feature arranged in a separate layer than a content of the one or more structured answer objects and the cross referencing creating an inter-layer link between the one or more structured answer objects and the same product support article” does not appear in the specification.

As per claims 9, 23, 39, and 50, the limitation “wherein the input comprises a text-based symptom description and identification of the product” does not appear in the specification.

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Rather, the specification states that the input comprises a text-based symptom description or identification of the product, see par. 36. Likewise, the limitation “wherein the text-based symptom description and identification of a product provided by the user” is new.

As per claims 14, 22, 28, 38, and 44, the limitation “provide(ing) additional clustering analysis generated by a human being” does not appear in the specification.

As per claim 23, the limitation “the response comprising information obtained from a full-text search of an unstructured service requests log of end-user and product support engineer communications” does not appear in the specification.

As per claim 45, the “means for processing,” “means for storing,” “means for receiving,” and “means for generating” do not appear in the specification.

As per claim 50, the “means for processing,” “means for storing,” and “means for receiving” do not appear in the specification.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1, 3-5, 29-30, 45, 47-50, and 52-54 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The process of claims 1 and 3-5 is not statutory because abstract ideas alone are not patentable. To be patentable, a process must have a practical application and (1) be tied to a

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particular machine or (2) transform a particular article into a different state. *In re Comiskey*, 499 F.3d 1365, 1376-77 (Fed. Cir. 2007).

An algorithm that is only useful in connection with a computer is still not “tied” to a machine. *Gottschalk v. Benson*, 409 U.S. 63, 64, 71-72 (A method of converting binary-coded decimal numerals into pure binary numerals was “not limited to any particular art or technology, to any particular apparatus or machinery, or to any particular end use” and would “wholly preempt the mathematical formula and in practical effect would be a patent on the algorithm itself”). Rather, a claim reciting an algorithm is statutory only if, as employed in the process, “it is embodied in, operates on, transforms, or otherwise involves another class of statutory subject matter, i.e., a machine, manufacture, or composition of matter.” *In re Comiskey*, 499 F.3d at 1376.

Here, the method is not tied to a particular machine and does not transform a particular article. The mere recitation that a computer performs the method steps does not tie the method to a particular machine. A human could perform the method steps with a printout of the “unstructured service requests log.” Thus, the claim wholly preempts the algorithm and is not statutory.

As per claims 29-30, descriptive material can be characterized as either “functional descriptive material” or “nonfunctional descriptive material.” Both types of “descriptive material” are nonstatutory when claimed as descriptive material *per se*, 33 F.3d at 1360, 31 USPQ2d at 1759. When functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory

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in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994)

Merely claiming nonfunctional descriptive material, i.e., abstract ideas, stored on a computer-readable medium, in a computer, or on an electromagnetic carrier signal, does not make it statutory. See *Diehr*, 450 U.S. at 185-86, 209 USPQ at 8 (noting that the claims for an algorithm in *Benson* were unpatentable as abstract ideas because “[t]he sole practical application of the algorithm was in connection with the programming of a general purpose computer”). Here, the claims recite no more than a data structure stored on a disk, and are therefore directed to non-functional descriptive matter.

As per claims 45, 47-50, and 52-54, the specification does not define “means for processing” or “means for storing,” thus it is unknown if they are hardware elements. The specification does not define any of the other “means” either, thus, applying the broadest reasonable interpretation to the term, it would include software. Since the claims include no hardware but are directed to a machine, they are not statutory.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-15, 17-28, 31, 33-45, 47-50, and 52-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wing et al., U.S. 2005/0120112 (“Wing”), in view of Atamer, U.S.

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2004/0193560 (“Atamer”), in view of Roitblat, U.S. 6,189,002 (“Roitblat”), and in view of “Microsoft Computer Dictionary, Fifth Edition,” Microsoft Press, 2002 (“Microsoft”).

1. Wing teaches “*A computer-implemented method comprising: executing computer-readable instructions with a processor that, when executed, direct a computing device to perform the acts of;*” see Fig. 2 and par. 31, “The server 104 generally includes a processor 200.”

Wing teaches “*extracting metadata from the text of an unstructured service requests log of end-user and product support engineer communications, wherein the metadata comprise at least one of a product name, a symptom, a cause, a resolution, a problem diagnosis question, or a link to a product support article;*” see par. 41, “As used herein, an automated fix is an approved fix that can be automatically delivered... Accordingly, a key indicator may include a selected symptom... selected problem... or other identified characteristic. If a key indicator can be identified or derived from the appliance data 504 or from testing of the appliance 108, and if that identified key indicator is associated with an automated fix, the automated fix thus identified is delivered” and par. 8, “administered solutions to reported problems, hereinafter referred to as ‘approved fixes,’ are maintained as part of a solutions set database... Where a potential solution is newly created by a technician, that potential solution may be added to the solutions set database (i.e., the knowledge base),” where the claimed “extracting” identifies that a referenced “key indicator is associated with an automated fix,” the claimed “metadata” is the referenced “key indicator,” the claimed “unstructured service requests log” is the referenced “solutions set database,” and the claimed “product support engineer” is the referenced “technician.” See par. 52 for further description of how the “solutions set database” is populated with user-technician communications.

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Wing teaches “*aligning at least one of the product name, the symptom, the cause, the resolution, the problem diagnosis question, or the link to the product support article from the metadata to form one or more structured answer objects, wherein one structured answer object is formed from one unstructured service request log,*” see par. 41, “As used herein, an automated fix is an approved fix that can be automatically delivered... Accordingly, a key indicator may include a selected symptom... selected problem... or other identified characteristic. If a key indicator can be identified or derived from the appliance data 504 or from testing of the appliance 108, and if that identified key indicator is associated with an automated fix, the automated fix thus identified is delivered... The process of determining whether an automated fix is available may be performed in connection with each known component 536 or combination thereof,” where the claimed “aligning” is the referenced associating a “key indicator” with an “automated fix,” the claimed “answer object” is the referenced “automated fix” or “approved fix,” and the claimed one-to-one relationship is the referenced one-fix-to-one-component.

Wing teaches “*identifying a set of the one or more structured answer objects... wherein each structured answer object in the set comprises at least one of a term or a phrase related to a symptom description,*” see par. 41, “Accordingly, a key indicator may include a selected symptom... If a key indicator can be identified or derived from the appliance data 504 or from testing of the appliance 108, and if that identified key indicator is associated with an automated fix, the automated fix thus identified is delivered,” where the claimed “identifying” is the referenced identifying an “automated fix” and the claimed “term” is the referenced “key indicator” value. Wing does not teach “*based on the semantic clusters.*” Roitblat does, however, see Abstract, “These semantic profiles are then organized into clusters in order to minimize the

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time required to answer a query.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Roitblat’s teachings would have allowed Wing’s method to gain faster query responses, see Roitblat Abstract.

Wing teaches “*and providing problem diagnosis data from the set of the one or more structured answer objects to the user,*” see Fig. 16 and par. 76, “With reference now to FIGS. 16A and 16B, a screen shot of a personalized quick-fix list display is illustrated. Such a quick-fix list may be presented to an end user after automated procedures have identified approved fixes.” Wing does not teach “*wherein the problem diagnosis data comprises a one or more symptom description data fields, a one or more cause description data fields, and a one or more resolution description data fields.*” Atamer does, however, see par. 19, “The system also includes an output device for displaying the set of ranked relevant attributes” and par. 38, “Typically, the solved case data 18 will contain thousands of case records 20, each comprising a diagnostic solution or root cause of a problem, along with a set of attribute values,” where the claimed “symptom[s]” are the referenced “attribute values,” the claimed “cause” is the referenced “root cause,” and the claimed “resolution” is the referenced “solution.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Atamer’s teachings would have allowed Wing’s method to gain more values on which to rank (or cluster) the search results, see Atamer par. 19. Atamer does not teach “*organized into a hierarchical tree structure such that each symptom description data field is a parent node of a one or more of the cause description data fields, and each cause description data field is a parent node of a one or more resolution description data fields.*” Microsoft does,

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however, see Hierarchy, “A type of organization that, like a tree, branches into more specific units, each of which is ‘owned’ by the higher-level unit immediately above.” Although Microsoft does not teach that the symptom is a parent of the cause which is a parent of the resolution, there are only a finite number of ways to organize a symptom, a cause, and a resolution in a hierarchy. Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Microsoft’s teachings would have allowed Atamer’s method to display the logical links, or relationships, between separate pieces of data, see Microsoft, Hierarchy.

Wing does not teach “*clustering the one or more structured answer objects into semantic clusters, wherein the semantic clusters are reinforced by cross referencing the one or more structured answer objects based a link feature to a same product support article, the link feature arranged in a separate layer than a content of the one or more structured answer objects and the cross referencing creating an inter-layer link between the one or more structured answer objects and the same product support article.*” Roitblat does, however, see Abstract, “These semantic profiles are then organized into clusters in order to minimize the time required to answer a query. When a user queries the database, i.e., the set of documents, his or her query is similarly transformed into a semantic profile and compared with the semantic profiles of each cluster of documents. The query profile is then compared with each of the documents in that cluster.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Roitblat’s teachings would have allowed Wing’s method to gain faster query responses, see Roitblat Abstract.

3. Wing teaches “*The method of claim 1, and wherein the problem diagnosis data comprise a link to a product support article,*” see Fig. 15 and par. 75, “Accordingly, FIG. 15 is an example of a view of ‘how to’ instructions from which the end user may make a selection. The instructions displayed can be selected or ordered based on any relevant characteristic or identifier.”

4. Wing teaches “*The method of claim 1, and wherein converting the unstructured service requests, identifying the set, and providing the historic and hierarchically structured problem diagnosis data are performed by a server computing device, and wherein the method further comprises,*” see Fig. 1 and par. 29, “The system 100 generally includes a server 104 interconnected to one or more client computers 108a to 108n by a network 112.”

Wing teaches “*receiving, from a client computing device, the symptom description,*” see Fig. 1 and par. 31, “As shown, the technical support computers 116 may be interconnected to the server 104 and to a selected one or ones of client computers (i.e., appliances) 108 through the network 112.”

Wing teaches “*and wherein providing the historic and hierarchically structured problem diagnosis data further comprises: searching the index for terms and phrases that match term(s) in the symptom description to identify the one or more structured answer objects corresponding to the symptom description,*” see par. 69, “That is, the potential solution will be indexed according to the machine inventory information, problems selected, and/or symptom selected when the potential solution was created.”

Wing teaches “*and communicating the identified one or more structured answer objects to the client computing device for display by a troubleshooting wizard to the user,*” see par. 44,

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“If self-help associated with the identified component based on the manufacturer or model is available, it may be displayed to the end user as one or more self-help tutorials 556.”

5. Wing teaches “*The method of claim 1, wherein the method further comprises dynamically generating a knowledge base article from information provided by the set,*” see par. 8, “Accordingly, the content that can be delivered from the knowledge base is dynamic in that the available content is changing.”

9. Wing teaches “*A method at least partially implemented by a computing device comprising: executing computer-readable instructions with a processor that, when executed, direct a computing device to perform the acts of,*” see Fig. 2 and par. 31, “The server 104 generally includes a processor 200.”

Wing teaches “*communicating, by a troubleshooting wizard, a search request comprising a product problem description of a problem with a product generated from an input by a user of the troubleshooting wizard to a server computing device, wherein the input comprises a text-based symptom description and identification of the product,*” see par. 38, “With particular reference now to FIG. 5A, appliance data 504 is collected on the appliance or client computer 108... the appliance data comprises a number of items of information about the appliance 108, such as information regarding characteristics and features of the appliance and included components, such as hardware components, peripherals and software... In addition, appliance data can comprise information from the end user collected by presenting the end user with filtered or targeted questions... For example, the end user may initially be asked to generally indicate the problem or perceived problem.”

Wing teaches “*receiving a response from the server computing device,*” see par. 41, “As used herein, an automated fix is an approved fix that can be automatically delivered... If a key indicator can be identified or derived from the appliance data 504 or from testing of the appliance 108, and if that identified key indicator is associated with an automated fix, the automated fix thus identified is delivered.”

Wing teaches “*and responsive to receiving the response to the search request, presenting, by the troubleshooting wizard, the information from the response to the user, wherein the information comprises symptom... and resolutions from the unstructured service requests log of end-user and product support engineer communications... wherein the text-based symptom description and identification of a product provided by the user correspond to the symptom description data field,*” see Fig. 16, par. 76, “With reference now to FIGS. 16A and 16B, a screen shot of a personalized quick-fix list display is illustrated. Such a quick-fix list may be presented to an end user after automated procedures have identified approved fixes,” and par. 8, “administered solutions to reported problems, hereinafter referred to as ‘approved fixes,’ are maintained as part of a solutions set database... Where a potential solution is newly created by a technician, that potential solution may be added to the solutions set database (i.e., the knowledge base).” Wing does not teach “*wherein the information comprises symptoms, causes, and resolutions.*” Atamer does, however, see par. 19, “The system also includes an output device for displaying the set of ranked relevant attributes” and par. 38, “Typically, the solved case data 18 will contain thousands of case records 20, each comprising a diagnostic solution or root cause of a problem, along with a set of attribute values,” where the claimed “symptom[s]” are the referenced “attribute values,” the claimed “cause” is the referenced “root cause,” and the claimed

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“resolution” is the referenced “solution.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Atamer’s teachings would have allowed Wing’s method to gain more values on which to rank (or cluster) the search results, see Atamer par. 19. Atamer does not teach “*and the information is organized into a hierarchical tree structure such that a symptom description data field is a parent node of a one or more cause description data fields, and each cause description data field is a parent node of a one or more resolution description data fields.*”

Microsoft does, however, see Hierarchy, “A type of organization that, like a tree, branches into more specific units, each of which is ‘owned’ by the higher-level unit immediately above.”

Although Microsoft does not teach that the symptom is a parent of the cause which is a parent of the resolution, there are only a finite number of ways to organize a symptom, a cause, and a resolution in a hierarchy. Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Microsoft’s teachings would have allowed Atamer’s method to display the logical links, or relationships, between separate pieces of data, see Microsoft, Hierarchy.

11. Wing teaches “*The method of claim 9, wherein the information comprises a link to a product support article,*” see Fig. 15 and par. 75, “Accordingly, FIG. 15 is an example of a view of ‘how to’ instructions from which the end user may make a selection. The instructions displayed can be selected or ordered based on any relevant characteristic or identifier.”

12. Wing teaches “*The method of claim 9, wherein the information comprises a set of structured answer objects,*” see par. 41, “As used herein, an automated fix is an approved fix that

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can be automatically delivered,” where the claimed “answer object” is the referenced “automated fix” or “approved fix.”

13. Wing does not teach “*The method of claim 12, wherein respective ones of the structured answer objects are clustered by the server computing device as corresponding to one another, the clustering being based on: obtaining clustering information from separate types of objects that are arranged in separate layers, wherein each separate layer comprises a homogenous type of objects; and iteratively projecting and propagating the clustering information until the clustering converges.*” Roitblat does, however, see Abstract, “These semantic profiles are then organized into clusters in order to minimize the time required to answer a query. When a user queries the database, i.e., the set of documents, his or her query is similarly transformed into a semantic profile and compared with the semantic profiles of each cluster of documents. The query profile is then compared with each of the documents in that cluster.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Roitblat’s teachings would have allowed Wing’s method to gain faster query responses, see Roitblat Abstract.

14. Wing does not teach “*The method of claim 13, wherein the clustering is further based on unified clustering operations, wherein the unified clustering operations provide additional clustering analysis generated by a human being.*” Roitblat does, however, see Abstract, “When a user queries the database, i.e., the set of documents, his or her query is similarly transformed into a semantic profile and compared with the semantic profiles of each cluster of documents.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the

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invention to combine the teachings of the cited references because Roitblat's teachings would have allowed Wing's method to gain faster query responses, see Roitblat Abstract.

15. Wing teaches "*A computer-readable storage medium comprising computer-executable instructions for,*" see Fig. 2 and par. 31, "The server 104 generally includes a processor 200."

Wing teaches "*converting, by a computing device, unstructured service requests log of an end-user and a product support engineer communications to one or more structured answer objects, wherein each unstructured service request comprises product problem information... and product problem resolution information and each structured answer object corresponds to a single unstructured service request and the structured answer object represents the product problem information... and the product problem resolution information in a one-problem-one-cause-one-solution structure,*" see par. 41, "As used herein, an automated fix is an approved fix that can be automatically delivered... Accordingly, a key indicator may include a selected symptom... selected problem... or other identified characteristic. If a key indicator can be identified or derived from the appliance data 504 or from testing of the appliance 108, and if that identified key indicator is associated with an automated fix, the automated fix thus identified is delivered... The process of determining whether an automated fix is available may be performed in connection with each known component 536 or combination thereof" and par. 8, "administered solutions to reported problems, hereinafter referred to as 'approved fixes,' are maintained as part of a solutions set database... Where a potential solution is newly created by a technician, that potential solution may be added to the solutions set database (i.e., the knowledge base)." Wing does not teach "*wherein each unstructured service request comprises... product*

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problem cause information... and the structured answer object represents... the product problem cause information.” Atamer does, however, see par. 19, “The system also includes an output device for displaying the set of ranked relevant attributes” and par. 38, “Typically, the solved case data 18 will contain thousands of case records 20, each comprising a diagnostic solution or root cause of a problem, along with a set of attribute values.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Atamer’s teachings would have allowed Wing’s method to gain more values on which to rank (or cluster) the search results, see Atamer par. 19.

Wing teaches “*receiving, from a client computing device, a product problem description,*” see par. 38, “In addition, appliance data can comprise information from the end user collected by presenting the end user with filtered or targeted questions... For example, the end user may initially be asked to generally indicate the problem or perceived problem.”

Wing teaches “*identifying a set of the structured answer objects, each structured answer object in the set comprising terms and phrases related to the product problem description,*” see par. 41, “Accordingly, a key indicator may include a selected symptom... If a key indicator can be identified or derived from the appliance data 504 or from testing of the appliance 108, and if that identified key indicator is associated with an automated fix, the automated fix thus identified is delivered.”

Wing does not teach “*generating semantic clusters from the set of structured answer objects based on content and link features of the structured answer objects by using a two-ways k-means mutual reinforcement clustering algorithm to iteratively cluster each structured answer object to a lower dimensional feature space.*” Roitblat does, however, see Abstract, “These

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semantic profiles are then organized into clusters in order to minimize the time required to answer a query. When a user queries the database, i.e., the set of documents, his or her query is similarly transformed into a semantic profile and compared with the semantic profiles of each cluster of documents. The query profile is then compared with each of the documents in that cluster” and col. 6, l. 53 – col. 7, l. 17, “In order to speed up searching the database, the profiles for each of the cached documents can be organized into clusters using... K-means clustering statistical procedure.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Roitblat’s teachings would have allowed Wing’s method to gain faster query responses, see Roitblat Abstract. Roitblat does not teach “*wherein the semantic clusters represent product problem information, product problem cause information, and product problem resolution information.*” Atamer does, however, see par. 19, “The system also includes an output device for displaying the set of ranked relevant attributes” and par. 38, “Typically, the solved case data 18 will contain thousands of case records 20, each comprising a diagnostic solution or root cause of a problem, along with a set of attribute values.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Atamer’s teachings would have allowed Wing’s method to gain more values on which to rank (or cluster) the search results, see Atamer par. 19. Wing teaches “*from a plurality of unstructured service requests logs in a hierarchical one-problem-to-multiple-cause-multiple-solution structure,*” see par. 41, “As used herein, an automated fix is an approved fix that can be automatically delivered... The process of determining whether an automated fix is

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available may be performed in connection with each known component 536 or combination thereof.”

Wing teaches “*and providing problem diagnosis data comprising the product problem cause information, and the product problem resolution information from the semantic clusters to an end-user for product problem diagnosis,*” see Fig. 16 and par. 76, “With reference now to FIGS. 16A and 16B, a screen shot of a personalized quick-fix list display is illustrated. Such a quick-fix list may be presented to an end user after automated procedures have identified approved fixes.”

17. Wing teaches “*The computer-readable storage medium of claim 15, and wherein the problem diagnosis data comprise a link to a product support article,*” see Fig. 15 and par. 75, “Accordingly, FIG. 15 is an example of a view of ‘how to’ instructions from which the end user may make a selection. The instructions displayed can be selected or ordered based on any relevant characteristic or identifier.”

18. Wing teaches “*The computer-readable storage medium of claim 15, wherein providing the problem diagnosis data further comprises: communicating the set to the client computing device for display by a troubleshooting wizard to the end-user,*” see par. 44, “If self-help associated with the identified component based on the manufacturer or model is available, it may be displayed to the end user as one or more self-help tutorials 556.”

19. Wing teaches “*The computer-readable storage medium of claim 15, wherein the computer-executable instruction further comprise instructions for dynamically generating a knowledge base article from information provided by the set,*” see par. 8, “Accordingly, the

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content that can be delivered from the knowledge base is dynamic in that the available content is changing.”

20. Wing teaches “*The computer-readable storage medium of claim 15, wherein after converting the unstructured service requests and before identifying the set, the computer-executable instruction further comprise instructions for: generating an index by: extracting features from the structured answer objects; analyzing the features to identify the terms and the phrases; assigning relevance weight to the terms and the phrases; normalizing terminology within the terms and the phrases; and wherein identifying the set is based on information in the index,*” see par. 69, “The potential solution is indexed without requiring further information by the technician. That is, the potential solution will be indexed according to the machine inventory information, problems selected, and/or symptom selected when the potential solution was created. Furthermore, the potential solution may appear among a number of potential solutions indicated when a general category applicable to the selected entry in the machine inventory window 764 is later made, as well as when a particular entry corresponding to the selection made when the potential solution was created is later selected. In accordance with further embodiments, the technician may associate the potential solution with a key indicator.”

21. Wing does not teach “*The computer-readable storage medium of claim 20, wherein after converting the unstructured service requests and before identifying the set, the computer-executable instruction further comprise instructions for: clustering respective ones of the structured answer objects based on the index to group related structured answer objects; and wherein providing the set, the set comprises a reinforced cluster of structured answer objects, reinforced by cross referencing the one or more structured answer objects that include an inter-*

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layer link to a same product support article.” Roitblat does, however, see Abstract, “These semantic profiles are then organized into clusters in order to minimize the time required to answer a query. When a user queries the database, i.e., the set of documents, his or her query is similarly transformed into a semantic profile and compared with the semantic profiles of each cluster of documents. The query profile is then compared with each of the documents in that cluster.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Roitblat’s teachings would have allowed Wing’s method to gain faster query responses, see Roitblat Abstract.

22. Wing does not teach “*The computer-readable storage medium of claim 21, wherein clustering comprises: obtaining clustering information from separate types of objects that are arranged in separate layers, wherein each separate layer comprises a homogenous type of objects; iteratively projecting and propagating the clustering information until the clustering converges; and unifying the clustering by providing additional clustering analysis generated by a human being.*” Roitblat does, however, see Abstract, “These semantic profiles are then organized into clusters in order to minimize the time required to answer a query. When a user queries the database, i.e., the set of documents, his or her query is similarly transformed into a semantic profile and compared with the semantic profiles of each cluster of documents. The query profile is then compared with each of the documents in that cluster.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Roitblat’s teachings would have allowed Wing’s method to gain faster query responses, see Roitblat Abstract.

23. Wing teaches “*A computer-readable storage medium comprising computer-executable instructions executable on a computing device for,*” see Fig. 2 and par. 31, “The server 104 generally includes a processor 200.”

Wing teaches “*communicating, by a troubleshooting wizard, a search request comprising a product problem description of a problem with a product generated from an input by a user of the troubleshooting wizard to a server computing device, wherein the input comprises a text-based symptom description and identification of the product,*” see par. 38, “With particular reference now to FIG. 5A, appliance data 504 is collected on the appliance or client computer 108... the appliance data comprises a number of items of information about the appliance 108, such as information regarding characteristics and features of the appliance and included components, such as hardware components, peripherals and software... In addition, appliance data can comprise information from the end user collected by presenting the end user with filtered or targeted questions... For example, the end user may initially be asked to generally indicate the problem or perceived problem.”

Wing teaches “*receiving a response from the server computing device, the response comprising information obtained from a full-text search of an unstructured service requests log of end-user and product support engineer communications,*” see par. 41, “As used herein, an automated fix is an approved fix that can be automatically delivered... If a key indicator can be identified or derived from the appliance data 504 or from testing of the appliance 108, and if that identified key indicator is associated with an automated fix, the automated fix thus identified is delivered.”

Wing teaches “*and responsive to receiving the response to the search request, presenting, by the troubleshooting wizard, the information from the response to the user, wherein the information comprises symptoms... and resolutions from the unstructured service requests log of end-user and product support engineer communications... wherein the text-based symptom description and identification of a product provided by the user correspond to the symptom description data field,*” see Fig. 16, par. 76, “With reference now to FIGS. 16A and 16B, a screen shot of a personalized quick-fix list display is illustrated. Such a quick-fix list may be presented to an end user after automated procedures have identified approved fixes,” and par. 8, “administered solutions to reported problems, hereinafter referred to as ‘approved fixes,’ are maintained as part of a solutions set database... Where a potential solution is newly created by a technician, that potential solution may be added to the solutions set database (i.e., the knowledge base).” Wing does not teach “*wherein the information comprises symptoms, causes, and resolutions.*” Atamer does, however, see par. 19, “The system also includes an output device for displaying the set of ranked relevant attributes” and par. 38, “Typically, the solved case data 18 will contain thousands of case records 20, each comprising a diagnostic solution or root cause of a problem, along with a set of attribute values,” where the claimed “symptom[s]” are the referenced “attribute values,” the claimed “cause” is the referenced “root cause,” and the claimed “resolution” is the referenced “solution.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Atamer’s teachings would have allowed Wing’s method to gain more values on which to rank (or cluster) the search results, see Atamer par. 19. Atamer does not teach “*and the information is organized into a hierarchical tree structure such that a symptom description*

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data field is a parent node of a one or more cause description data fields, and each cause description data field is a parent node of a one or more resolution description data fields.”

Microsoft does, however, see Hierarchy, “A type of organization that, like a tree, branches into more specific units, each of which is ‘owned’ by the higher-level unit immediately above.”

Although Microsoft does not teach that the symptom is a parent of the cause which is a parent of the resolution, there are only a finite number of ways to organize a symptom, a cause, and a resolution in a hierarchy. Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Microsoft’s teachings would have allowed Atamer’s method to display the logical links, or relationships, between separate pieces of data, see Microsoft, Hierarchy.

24. Wing teaches “*The computer-readable storage medium of claim 23, wherein the information comprises any one or more of hierarchically structured product problem description, symptom, cause, and resolution information,*” see par. 41, “Accordingly, a key indicator may include a selected symptom... selected problem... or other identified characteristic.

25. Wing teaches “*The computer-readable storage medium of claim 23, wherein the information comprises a link to a product support article,*” see Fig. 15 and par. 75, “Accordingly, FIG. 15 is an example of a view of ‘how to’ instructions from which the end user may make a selection. The instructions displayed can be selected or ordered based on any relevant characteristic or identifier.”

26. Wing teaches “*The computer-readable storage medium of claim 23, wherein the information comprises a set of structured answer objects,*” see par. 41, “As used herein, an

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automated fix is an approved fix that can be automatically delivered,” where the claimed “answer object” is the referenced “automated fix” or “approved fix.”

27. Wing does not teach “*The computer-readable storage medium of claim 26, wherein respective ones of the structured answer objects were clustered by the server computing device as corresponding to one-another, the clustering being based on: obtaining clustering information from separate types of objects that are arranged in separate layers, wherein each separate layer comprises a homogenous type of objects; and iteratively projecting and propagating the clustering information until the clustering converges.*” Roitblat does, however, see Abstract, “These semantic profiles are then organized into clusters in order to minimize the time required to answer a query. When a user queries the database, i.e., the set of documents, his or her query is similarly transformed into a semantic profile and compared with the semantic profiles of each cluster of documents. The query profile is then compared with each of the documents in that cluster.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Roitblat’s teachings would have allowed Wing’s method to gain faster query responses, see Roitblat Abstract.

28. Wing does not teach “*The computer-readable storage medium of claim 27, wherein the clustering is further based on unified clustering operations, wherein the unified clustering operations provide additional clustering analysis generated by a human being.*” Roitblat does, however, see Abstract, “When a user queries the database, i.e., the set of documents, his or her query is similarly transformed into a semantic profile and compared with the semantic profiles of each cluster of documents.” Thus, it would have been obvious to one of ordinary skill in the

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database art at the time of the invention to combine the teachings of the cited references because Roitblat's teachings would have allowed Wing's method to gain faster query responses, see Roitblat Abstract.

31. Wing teaches "*A computing device comprising: a processor; and a memory coupled to the processor, the memory comprising computer-program instructions executable by the processor for,*" see Fig. 2 and par. 31, "The server 104 generally includes a processor 200."

Wing teaches "*converting, by a computing device, unstructured service requests log of end-user and a product support engineer communications to one or more structured answer objects, wherein each unstructured service request comprises product problem information... and product problem resolution information and each structured answer object corresponds to a single unstructured service request and the structured answer object represents the product problem information... and the product problem resolution information in a one-problem-one-cause-one-solution structure,*" see par. 41, "As used herein, an automated fix is an approved fix that can be automatically delivered... Accordingly, a key indicator may include a selected symptom... selected problem... or other identified characteristic. If a key indicator can be identified or derived from the appliance data 504 or from testing of the appliance 108, and if that identified key indicator is associated with an automated fix, the automated fix thus identified is delivered... The process of determining whether an automated fix is available may be performed in connection with each known component 536 or combination thereof" and par. 8, "administered solutions to reported problems, hereinafter referred to as 'approved fixes,' are maintained as part of a solutions set database... Where a potential solution is newly created by a technician, that potential solution may be added to the solutions set database (i.e., the knowledge

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base).” Wing does not teach “*wherein each unstructured service request comprises... product problem cause information... and the structured answer object represents... the product problem cause information.*” Atamer does, however, see par. 19, “The system also includes an output device for displaying the set of ranked relevant attributes” and par. 38, “Typically, the solved case data 18 will contain thousands of case records 20, each comprising a diagnostic solution or root cause of a problem, along with a set of attribute values.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Atamer’s teachings would have allowed Wing’s method to gain more values on which to rank (or cluster) the search results, see Atamer par. 19.

Wing teaches “*receiving, from a client computing device, a product problem description,*” see par. 38, “In addition, appliance data can comprise information from the end user collected by presenting the end user with filtered or targeted questions... For example, the end user may initially be asked to generally indicate the problem or perceived problem.”

Wing teaches “*identifying a set of the structured answer objects, each structured answer object in the set comprising terms and phrases related to the product problem description,*” see par. 41, “Accordingly, a key indicator may include a selected symptom... If a key indicator can be identified or derived from the appliance data 504 or from testing of the appliance 108, and if that identified key indicator is associated with an automated fix, the automated fix thus identified is delivered.”

Wing does not teach “*generating semantic clusters from the set of structured answer objects based on content and link features of the structured answer objects by using a two-ways k-means mutual reinforcement clustering algorithm to iteratively cluster each structured answer*

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object to a lower dimensional feature space.” Roitblat does, however, see Abstract, “These semantic profiles are then organized into clusters in order to minimize the time required to answer a query. When a user queries the database, i.e., the set of documents, his or her query is similarly transformed into a semantic profile and compared with the semantic profiles of each cluster of documents. The query profile is then compared with each of the documents in that cluster” and col. 6, l. 53 – col. 7, l. 17, “In order to speed up searching the database, the profiles for each of the cached documents can be organized into clusters using... K-means clustering statistical procedure.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Roitblat’s teachings would have allowed Wing’s method to gain faster query responses, see Roitblat Abstract. Roitblat does not teach “*wherein the semantic clusters represent product problem information, product problem cause information, and product problem resolution information.*” Atamer does, however, see par. 19, “The system also includes an output device for displaying the set of ranked relevant attributes” and par. 38, “Typically, the solved case data 18 will contain thousands of case records 20, each comprising a diagnostic solution or root cause of a problem, along with a set of attribute values.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Atamer’s teachings would have allowed Wing’s method to gain more values on which to rank (or cluster) the search results, see Atamer par. 19. Wing teaches “*from a plurality of unstructured service requests logs in a hierarchical one-problem-to-multiple-cause-multiple-solution structure,*” see par. 41, “As used herein, an automated fix is an approved fix that can be automatically delivered... The process of determining whether an automated fix is

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available may be performed in connection with each known component 536 or combination thereof.”

Wing teaches “*and providing problem diagnosis data comprising the product problem cause information, and the product problem resolution information from the semantic clusters to an end-user for product problem diagnosis,*” see Fig. 16 and par. 76, “With reference now to FIGS. 16A and 16B, a screen shot of a personalized quick-fix list display is illustrated. Such a quick-fix list may be presented to an end user after automated procedures have identified approved fixes.”

33. Wing teaches “*The computing device of claim 31, and wherein the problem diagnosis data comprise a link to a product support article,*” see Fig. 15 and par. 75, “Accordingly, FIG. 15 is an example of a view of ‘how to’ instructions from which the end user may make a selection. The instructions displayed can be selected or ordered based on any relevant characteristic or identifier.”

34. Wing teaches “*The computing device of claim 31, wherein providing the product problem diagnosis data further comprises: searching an index for terms and phrases that match terms and phrases in the product problem description to identify the one or more structured answer objects in the set,*” see par. 69, “The potential solution is indexed without requiring further information by the technician. That is, the potential solution will be indexed according to the machine inventory information, problems selected, and/or symptom selected when the potential solution was created.”

Wing teaches “*and communicating the set to the client computing device for display by a troubleshooting wizard to the end-user,*” see par. 44, “If self-help associated with the identified

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component based on the manufacturer or model is available, it may be displayed to the end user as one or more self-help tutorials 556.”

35. Wing teaches “*The computing device of claim 31, wherein the computer-executable instruction further comprise instructions for dynamically generating a knowledge base article from information provided by the set,*” see par. 8, “Accordingly, the content that can be delivered from the knowledge base is dynamic in that the available content is changing.”

36. Wing teaches “*The computing device of claim 31, wherein after converting the unstructured service requests and before identifying the set, the computer- executable instruction further comprise instructions for: generating an index by: extracting features from the structured answer objects; analyzing the features to identify the terms and the phrases; assigning relevance weight to the terms and the phrases; normalizing terminology within the terms and the phrases; and wherein identifying the set is based on information in the index,*” see par. 69, “The potential solution is indexed without requiring further information by the technician. That is, the potential solution will be indexed according to the machine inventory information, problems selected, and/or symptom selected when the potential solution was created. Furthermore, the potential solution may appear among a number of potential solutions indicated when a general category applicable to the selected entry in the machine inventory window 764 is later made, as well as when a particular entry corresponding to the selection made when the potential solution was created is later selected. In accordance with further embodiments, the technician may associate the potential solution with a key indicator.”

37. Wing does not teach “*The computing device of claim 36, wherein after converting the unstructured service requests and before identifying the set, the computer-executable instruction*

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further comprise instructions for: clustering respective ones of the structured answer objects based on the index to group related structured answer objects; and wherein providing the set, the set comprises a reinforced cluster of structured answer objects, reinforced by cross referencing the one or more structured answer objects that include an inter-layer link to a same product support article.” Roitblat does, however, see Abstract, “These semantic profiles are then organized into clusters in order to minimize the time required to answer a query. When a user queries the database, i.e., the set of documents, his or her query is similarly transformed into a semantic profile and compared with the semantic profiles of each cluster of documents. The query profile is then compared with each of the documents in that cluster.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Roitblat’s teachings would have allowed Wing’s method to gain faster query responses, see Roitblat Abstract.

38. Wing does not teach “*The computing device of claim 37, wherein clustering comprises: obtaining clustering information from separate types of objects that are arranged in separate layers, wherein each separate layer comprises a homogenous type of objects; iteratively projecting and propagating the clustering information until the clustering converges; and unifying the clustering by providing additional clustering analysis generated by a human being.*” Roitblat does, however, see Abstract, “These semantic profiles are then organized into clusters in order to minimize the time required to answer a query. When a user queries the database, i.e., the set of documents, his or her query is similarly transformed into a semantic profile and compared with the semantic profiles of each cluster of documents. The query profile is then compared with each of the documents in that cluster.” Thus, it would have been obvious

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to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Roitblat's teachings would have allowed Wing's method to gain faster query responses, see Roitblat Abstract.

39. Wing teaches "*A computing device comprising: a processor; and a memory coupled to the processor, the memory comprising computer-program instructions executable by the processor for,*" see Fig. 2 and par. 31, "The server 104 generally includes a processor 200."

Wing teaches "*communicating, by a troubleshooting wizard, a search request comprising a product problem description of a problem with a product generated from an input by a user of the troubleshooting wizard to a server computing device, wherein the input comprises a text-based symptom description and identification of the product,*" see par. 38, "With particular reference now to FIG. 5A, appliance data 504 is collected on the appliance or client computer 108... the appliance data comprises a number of items of information about the appliance 108, such as information regarding characteristics and features of the appliance and included components, such as hardware components, peripherals and software... In addition, appliance data can comprise information from the end user collected by presenting the end user with filtered or targeted questions... For example, the end user may initially be asked to generally indicate the problem or perceived problem."

Wing teaches "*receiving a response from the server computing device, the response comprising information obtained from an unstructured service requests log of end-user and product support engineer communications,*" see par. 41, "As used herein, an automated fix is an approved fix that can be automatically delivered... If a key indicator can be identified or derived

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from the appliance data 504 or from testing of the appliance 108, and if that identified key indicator is associated with an automated fix, the automated fix thus identified is delivered.”

Wing teaches “*and responsive to receiving the response to the search request, presenting, by the troubleshooting wizard, the information from the response to the user, the information comprising symptoms... and resolutions from the unstructured service requests log of end-user and product support engineer communications... wherein the text-based symptom description and identification of a product provided by the user correspond to the symptom description data field,*” see Fig. 16, par. 76, “With reference now to FIGS. 16A and 16B, a screen shot of a personalized quick-fix list display is illustrated. Such a quick-fix list may be presented to an end user after automated procedures have identified approved fixes,” and par. 8, “administered solutions to reported problems, hereinafter referred to as ‘approved fixes,’ are maintained as part of a solutions set database... Where a potential solution is newly created by a technician, that potential solution may be added to the solutions set database (i.e., the knowledge base).” Wing does not teach “*wherein the information comprises symptoms, causes, and resolutions.*” Atamer does, however, see par. 19, “The system also includes an output device for displaying the set of ranked relevant attributes” and par. 38, “Typically, the solved case data 18 will contain thousands of case records 20, each comprising a diagnostic solution or root cause of a problem, along with a set of attribute values,” where the claimed “symptom[s]” are the referenced “attribute values,” the claimed “cause” is the referenced “root cause,” and the claimed “resolution” is the referenced “solution.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Atamer’s teachings would have allowed Wing’s method to gain more values

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on which to rank (or cluster) the search results, see Atamer par. 19. Atamer does not teach “*and the information is organized into a hierarchical tree structure such that a symptom description data field is a parent node of a one or more cause description data fields, and each cause description data field is a parent node of a one or more resolution description data fields.*”

Microsoft does, however, see Hierarchy, “A type of organization that, like a tree, branches into more specific units, each of which is ‘owned’ by the higher-level unit immediately above.”

Although Microsoft does not teach that the symptom is a parent of the cause which is a parent of the resolution, there are only a finite number of ways to organize a symptom, a cause, and a resolution in a hierarchy. Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Microsoft’s teachings would have allowed Atamer’s method to display the logical links, or relationships, between separate pieces of data, see Microsoft, Hierarchy.

41. Wing teaches “*The computing device of claim 39, wherein the information comprises a link to a product support article,*” see Fig. 15 and par. 75, “Accordingly, FIG. 15 is an example of a view of ‘how to’ instructions from which the end user may make a selection. The instructions displayed can be selected or ordered based on any relevant characteristic or identifier.”

42. Wing teaches “*The computing device of claim 39, wherein the information comprises a set of structured answer objects,*” see par. 41, “As used herein, an automated fix is an approved fix that can be automatically delivered,” where the claimed “answer object” is the referenced “automated fix” or “approved fix.”

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43. Wing does not teach “*The computing device of claim 42, wherein respective ones of the structured answer objects were clustered by the server computing device as corresponding to one-another, the clustering being based on: obtaining clustering information from separate types of objects that are arranged in separate layers, wherein each separate layer comprises a homogenous type of objects; and iteratively projecting and propagating the clustering information until the clustering converges.*” Roitblat does, however, see Abstract, “These semantic profiles are then organized into clusters in order to minimize the time required to answer a query. When a user queries the database, i.e., the set of documents, his or her query is similarly transformed into a semantic profile and compared with the semantic profiles of each cluster of documents. The query profile is then compared with each of the documents in that cluster.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Roitblat’s teachings would have allowed Wing’s method to gain faster query responses, see Roitblat Abstract.

44. Wing does not teach “*The computing device of claim 43, wherein the clustering is further based on unified clustering operations, wherein the unified clustering operations provide additional clustering analysis generated by a human being.*” Roitblat does, however, see Abstract, “When a user queries the database, i.e., the set of documents, his or her query is similarly transformed into a semantic profile and compared with the semantic profiles of each cluster of documents.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Roitblat’s teachings would have allowed Wing’s method to gain faster query responses, see Roitblat Abstract.

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45. Wing teaches “*A computing device comprising: means for processing; means for storing computer-program instructions executable by the processing means, wherein the instructions, when executed enable,*” see Fig. 2 and par. 31, “The server 104 generally includes a processor 200.”

Wing teaches “*means for converting unstructured service requests log_of end-user and product support engineer communications to one or more structured answer objects, wherein each unstructured service request comprises product problem information... and product problem resolution information and each structured answer object corresponds to a single unstructured service request and the structured answer object represents the product problem information... and the product problem resolution information in a one-problem-one-cause-one-solution structure,*” see par. 41, “As used herein, an automated fix is an approved fix that can be automatically delivered... Accordingly, a key indicator may include a selected symptom... selected problem... or other identified characteristic. If a key indicator can be identified or derived from the appliance data 504 or from testing of the appliance 108, and if that identified key indicator is associated with an automated fix, the automated fix thus identified is delivered... The process of determining whether an automated fix is available may be performed in connection with each known component 536 or combination thereof” and par. 8, “administered solutions to reported problems, hereinafter referred to as ‘approved fixes,’ are maintained as part of a solutions set database... Where a potential solution is newly created by a technician, that potential solution may be added to the solutions set database (i.e., the knowledge base).” Wing does not teach “*wherein each unstructured service request comprises... product problem cause information... and the structured answer object represents... the product problem cause*

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information.” Atamer does, however, see par. 19, “The system also includes an output device for displaying the set of ranked relevant attributes” and par. 38, “Typically, the solved case data 18 will contain thousands of case records 20, each comprising a diagnostic solution or root cause of a problem, along with a set of attribute values.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Atamer’s teachings would have allowed Wing’s method to gain more values on which to rank (or cluster) the search results, see Atamer par. 19.

Wing teaches “*means for receiving, from a client computing device, a product problem description,*” see par. 38, “In addition, appliance data can comprise information from the end user collected by presenting the end user with filtered or targeted questions... For example, the end user may initially be asked to generally indicate the problem or perceived problem.”

Wing teaches “*means for identifying a set of the structured answer objects, each structured answer object in the set comprising terms and phrases related to the product problem description,*” see par. 41, “Accordingly, a key indicator may include a selected symptom... If a key indicator can be identified or derived from the appliance data 504 or from testing of the appliance 108, and if that identified key indicator is associated with an automated fix, the automated fix thus identified is delivered.”

Wing does not teach “*and means for generating semantic clusters from the set of structured answer objects based on content and link features of the structured answer objects by using a two-ways k-means mutual reinforcement clustering algorithm to iteratively cluster each structured answer object to a lower dimensional feature space.*” Roitblat does, however, see Abstract, “These semantic profiles are then organized into clusters in order to minimize the time

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required to answer a query. When a user queries the database, i.e., the set of documents, his or her query is similarly transformed into a semantic profile and compared with the semantic profiles of each cluster of documents. The query profile is then compared with each of the documents in that cluster” and col. 6, l. 53 – col. 7, l. 17, “In order to speed up searching the database, the profiles for each of the cached documents can be organized into clusters using... K-means clustering statistical procedure.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Roitblat’s teachings would have allowed Wing’s method to gain faster query responses, see Roitblat Abstract. Roitblat does not teach “*wherein the semantic clusters represent product problem information, product problem cause information, and product problem resolution information.*” Atamer does, however, see par. 19, “The system also includes an output device for displaying the set of ranked relevant attributes” and par. 38, “Typically, the solved case data 18 will contain thousands of case records 20, each comprising a diagnostic solution or root cause of a problem, along with a set of attribute values.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Atamer’s teachings would have allowed Wing’s method to gain more values on which to rank (or cluster) the search results, see Atamer par. 19. Wing teaches “*from a plurality of unstructured service requests logs in a hierarchical one-problem-to-multiple-cause-multiple-solution structure,*” see par. 41, “As used herein, an automated fix is an approved fix that can be automatically delivered... The process of determining whether an automated fix is available may be performed in connection with each known component 536 or combination thereof.”

Wing teaches “*and means for providing product problem diagnosis data comprising the product problem cause information, and the product problem resolution information from the semantic clusters to an end-user for product problem diagnosis,*” see Fig. 16 and par. 76, “With reference now to FIGS. 16A and 16B, a screen shot of a personalized quick-fix list display is illustrated. Such a quick-fix list may be presented to an end user after automated procedures have identified approved fixes.”

47. Wing teaches “*The computing device of claim 45, and wherein the problem diagnosis data comprise a link to a product support article,*” see Fig. 15 and par. 75, “Accordingly, FIG. 15 is an example of a view of ‘how to’ instructions from which the end user may make a selection. The instructions displayed can be selected or ordered based on any relevant characteristic or identifier.”

48. Wing teaches “*The computing device of claim 45, wherein the means for providing the structured product problem diagnosis data further comprises: means for searching an index for terms and phrases that match terms and phrases in the product problem description to identify the one or more structured answer objects in the set,*” see par. 69, “The potential solution is indexed without requiring further information by the technician. That is, the potential solution will be indexed according to the machine inventory information, problems selected, and/or symptom selected when the potential solution was created.”

Wing teaches “*and means for communicating the set to the client computing device for display by a troubleshooting wizard to the end-user,*” see par. 44, “If self-help associated with the identified component based on the manufacturer or model is available, it may be displayed to the end user as one or more self-help tutorials 556.”

49. Wing teaches “*The computing device of claim 45, further comprising means for dynamically generating a knowledge base article from information provided by the set,*” see par. 8, “Accordingly, the content that can be delivered from the knowledge base is dynamic in that the available content is changing.”

50. Wing teaches “*A computing device comprising: means for processing; means for storing computer-program instructions executable by the processing means, wherein the instructions when executed enable,*” see Fig. 2 and par. 31, “The server 104 generally includes a processor 200.”

Wing teaches “*means for communicating a search request comprising a product problem description of a problem with a product generated from an input by a user of the computing device to a server device, wherein the input comprises a text-based symptom description and identification of the product,*” see par. 38, “With particular reference now to FIG. 5A, appliance data 504 is collected on the appliance or client computer 108... the appliance data comprises a number of items of information about the appliance 108, such as information regarding characteristics and features of the appliance and included components, such as hardware components, peripherals and software... In addition, appliance data can comprise information from the end user collected by presenting the end user with filtered or targeted questions... For example, the end user may initially be asked to generally indicate the problem or perceived problem.”

Wing teaches “*means for receiving a response from the server computing device, the response comprising information obtained from an unstructured service requests log of end-user and product support engineer communications,*” see par. 41, “As used herein, an automated fix is

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an approved fix that can be automatically delivered... If a key indicator can be identified or derived from the appliance data 504 or from testing of the appliance 108, and if that identified key indicator is associated with an automated fix, the automated fix thus identified is delivered.”

Wing teaches “*and responsive to receiving the response to the search request, means for presenting the information from the response to the user, the information comprising symptoms... and resolutions from the unstructured service requests log of end-user and product support engineer communications... wherein the text-based symptom description and identification of a product provided by the user correspond to the symptom description data field,*” see Fig. 16, par. 76, “With reference now to FIGS. 16A and 16B, a screen shot of a personalized quick-fix list display is illustrated. Such a quick-fix list may be presented to an end user after automated procedures have identified approved fixes,” and par. 8, “administered solutions to reported problems, hereinafter referred to as ‘approved fixes,’ are maintained as part of a solutions set database... Where a potential solution is newly created by a technician, that potential solution may be added to the solutions set database (i.e., the knowledge base).” Wing does not teach “*wherein the information comprises symptoms, causes, and resolutions.*” Atamer does, however, see par. 19, “The system also includes an output device for displaying the set of ranked relevant attributes” and par. 38, “Typically, the solved case data 18 will contain thousands of case records 20, each comprising a diagnostic solution or root cause of a problem, along with a set of attribute values,” where the claimed “symptom[s]” are the referenced “attribute values,” the claimed “cause” is the referenced “root cause,” and the claimed “resolution” is the referenced “solution.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited

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references because Atamer's teachings would have allowed Wing's method to gain more values on which to rank (or cluster) the search results, see Atamer par. 19. Atamer does not teach "*and the information is organized into a hierarchical tree structure such that a symptom description data field is a parent node of a one or more cause description data fields, and each cause description data field is a parent node of a one or more resolution description data fields.*"

Microsoft does, however, see Hierarchy, "A type of organization that, like a tree, branches into more specific units, each of which is 'owned' by the higher-level unit immediately above."

Although Microsoft does not teach that the symptom is a parent of the cause which is a parent of the resolution, there are only a finite number of ways to organize a symptom, a cause, and a resolution in a hierarchy. Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Microsoft's teachings would have allowed Atamer's method to display the logical links, or relationships, between separate pieces of data, see Microsoft, Hierarchy.

52. Wing teaches "*The computing device of claim 50, wherein the information comprises a link to a product support article,*" see Fig. 15 and par. 75, "Accordingly, FIG. 15 is an example of a view of 'how to' instructions from which the end user may make a selection. The instructions displayed can be selected or ordered based on any relevant characteristic or identifier."

53. Wing teaches "*The computing device of claim 50, wherein the information comprises a set of structured answer objects,*" see par. 41, "As used herein, an automated fix is an approved fix that can be automatically delivered," where the claimed "answer object" is the referenced "automated fix" or "approved fix."

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54. Wing does not teach “*The computing device of claim 53, wherein respective ones of the structured answer objects were clustered by the server computing device as corresponding to one another.*” Roitblat does, however, see Abstract, “These semantic profiles are then organized into clusters in order to minimize the time required to answer a query. When a user queries the database, i.e., the set of documents, his or her query is similarly transformed into a semantic profile and compared with the semantic profiles of each cluster of documents. The query profile is then compared with each of the documents in that cluster.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Roitblat’s teachings would have allowed Wing’s method to gain faster query responses, see Roitblat Abstract.

Claims 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atamer, U.S. 2004/0193560 (“Atamer”), in view of “Microsoft Computer Dictionary, Fifth Edition,” Microsoft Press, 2002 (“Microsoft”).

29. Atamer teaches “*A computer-readable storage medium comprising a structured answer object data structure for use in product problem analysis and diagnosis, the structured answer object data structure comprising: a product problem description data field; a product problem cause data field; and a product problem resolution data field,*” see par. 38, “Typically, the solved case data 18 will contain thousands of case records 20, each comprising a diagnostic solution or root cause of a problem, along with a set of attribute values,” where the claimed “description” is the referenced “attribute values,” the claimed “cause” is the referenced “root cause,” and the claimed “resolution” is the referenced “solution.”

Atamer does not teach “*wherein data fields are organized into a hierarchical tree structure such that the product problem description data field is a parent node of a one or more of the product problem cause data fields, and each product problem cause data field is a parent node of a one or more of the product problem resolution data fields.*” Microsoft does, however, see Hierarchy, “A type of organization that, like a tree, branches into more specific units, each of which is ‘owned’ by the higher-level unit immediately above.” Although Microsoft does not teach that the symptom is a parent of the cause which is a parent of the resolution, there are only a finite number of ways to organize a symptom, a cause, and a resolution in a hierarchy. Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Microsoft’s teachings would have allowed Atamer’s method to display the logical links, or relationships, between separate pieces of data, see Microsoft, Hierarchy.

30. Atamer teaches “*The computer-readable storage medium of claim 29, wherein the structured answer object data structure further comprises a product problem symptom data field,*” see par. 38, “Typically, the solved case data 18 will contain thousands of case records 20, each comprising a diagnostic solution or root cause of a problem, along with a set of attribute values,” where the claimed “symptom[s]” are the referenced “attribute values.”

Atamer does not teach “*the product problem description field being a parent node of the product problem symptom data field.*” Microsoft does, however, see Hierarchy, “A type of organization that, like a tree, branches into more specific units, each of which is ‘owned’ by the higher-level unit immediately above.” Although Microsoft does not teach that the symptom is a parent of the cause which is a parent of the resolution, there are only a finite number of ways to

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organize a symptom, a cause, and a resolution in a hierarchy. Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Microsoft's teachings would have allowed Atamer's method to display the logical links, or relationships, between separate pieces of data, see Microsoft, Hierarchy.

Response to Arguments

As per Applicant's argument that claims 45 and 47-50 are statutory under 35 U.S.C. 101, the Examiner respectfully disagrees. The specification and Fig. 5 do not define "means for processing" or "means for storing," thus it is unknown if they are hardware elements. The specification does not define any of the other "means" either, thus, applying the broadest reasonable interpretation to the term, it would include software. Since the claims include no hardware but are directed to a machine, they are not statutory.

Applicant's arguments with respect to the 35 U.S.C. 102 and 103 rejections of claims 1, 3-15, 17-28, 31, 33-45, 47-50, and 52-54 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron Sanders whose telephone number is 571-270-1016. The examiner can normally be reached on M-F 9:00a-4:00p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Vo can be reached on 571-272-3642. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tim T. Vo/
Supervisory Patent Examiner, Art Unit
2168

/Aaron Sanders/
Examiner, Art Unit 2168
30 January 2009